UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604

DATE: JUN 30 2014

SUBJECT: CLEAN AIR ACT INSPECTION REPORT
Grede Foundry- Kingsford, Dickinson County, Michigan

FROM: Patrick Miller, Environmental Engineer
AECAB (MN/OH)

THRU: Brian Dickens, Section Chief
AECAB (MN/OH)

TO: File

ATTACHMENTS: None

Facility: Grede Foundry

Location: 801 South Carpenter, Kingsford, Michigan 49802

Date of Inspection: August 15, 2012

Inspection Team:
Patrick Miller, USEPA, Environmental Engineer
Molly Smith, USEPA, Environmental Engineer

Facility Attendees:
Adam Buchcuski, Plant Manager, Grede Foundry
John Bomberg, Safety Supervisor, Grede Foundry

Purpose of the Inspection:
The purpose of the inspection was to determine Grede Foundry's compliance with the Clean Air Act (CAA).

Arrival and Opening Conference:
Ms. Smith and Mr. Miller of the EPA arrived at the facility at 8:35am. EPA asked to talk to the environmental manager or plant manager. EPA met Adam Buchcuski, plant manager, and John Bomberg, safety supervisor, presented credentials and informed them that this was an unannounced inspection pursuant to the Clean Air Act. Mr. Buchcuski informed EPA that Scott Flaminio, the environmental manager, and general manager were out of town at a sister plant. EPA asked Mr. Buchcuski for an overview of the facility and then a tour of the plant. Mr. Buchcuski provided information related to the overview of the company, the process and current status of operations at the facility. EPA informed Mr. Buchcuski that any information shared which is considered confidential business information (CBI) would be treated as such.

Overview of Company:
Grede Foundry (Grede) produces grey iron castings with few ductile iron castings. The facility was built in 1947 and was included when Grede merged with Foundry Citation Corp in 2010. There are 400 hourly and about 40 salaried employees at this facility. The facility operates 24 hours a day, 6 days a week. There is no production on Sundays. Mainly, Grede manufactures hydraulic valve components for general industry and agriculture. Grede has more than 1,000 different patterns for multiple customers. Production runs can range from under 1,000 pieces (low volume) to 50,000 pieces (high volume). The largest individual casting is around 80 lbs.

Process Discussion:
Grede utilizes a cupola furnace to melt scrap supplied via truck by Schneider Iron Supply. Natural gas is used initially to ignite coke and then the coke maintains the melt temperature of the furnace. The cupola has a capacity of 16 tons of charge and each charge is around 3000 lbs. The cupola has a recuperative hot blast system to preheat outside air. The burner zone reaches 3000°F to maintain a liquid iron temperature of 2700°F. The exhaust gas, which leave the cupola at 1600°F, is controlled first with an afterburner, which has a set point of 1500°F. After the afterburner, the exhaust gas passed through a quencher/mister which drops the temperature to approximately 550°F. The exhaust stream then passes through a baghouse before exiting to the atmosphere (Figure 1). The baghouse dust is treated with EnviroBlend to control lead and cadmium. The baghouse is equipped with a bag-leak detection system and differential pressure is continuously tracked.

Figure 1 Top of cupola furnace (right) and baghouse (left)

The liquid iron from the cupola is transferred and stored in a 30-ton holding furnace. The iron is transferred into 1000 lbs pouring ladles from the holding furnace (Figure 2) and brought to the molds for casting. There are five mold making machines and the facility has the capacity for a sixth. The molds are automatically made from green sand combined with water and a binder, typically bentonite clay, in a mixing mauler. "Compact-ability" of the sand is measured when pressing the molds and adjustments are automatically made to the ratios of green sand to water to binder. The molding machines are controlled by

wet dust collectors. The water from the wet dust collectors proceeds to a sludge tank with a drag chain. The sludge is dewatered and is used for beneficial reuse applications or landfilled.

Operators place cores in the molds to create open spaces or cavities in the final iron casting. The cores are made from the same green sand as the molds however a two part resin is added instead of water or bentonite clay. The green sand is mixed with the resins in a mauler and the ratios of sand to part one resin to part two resin is monitored and automatically adjusted. The cores are produced in automatic core making machines and after the cores have cured they are brought over to the mold making machines.

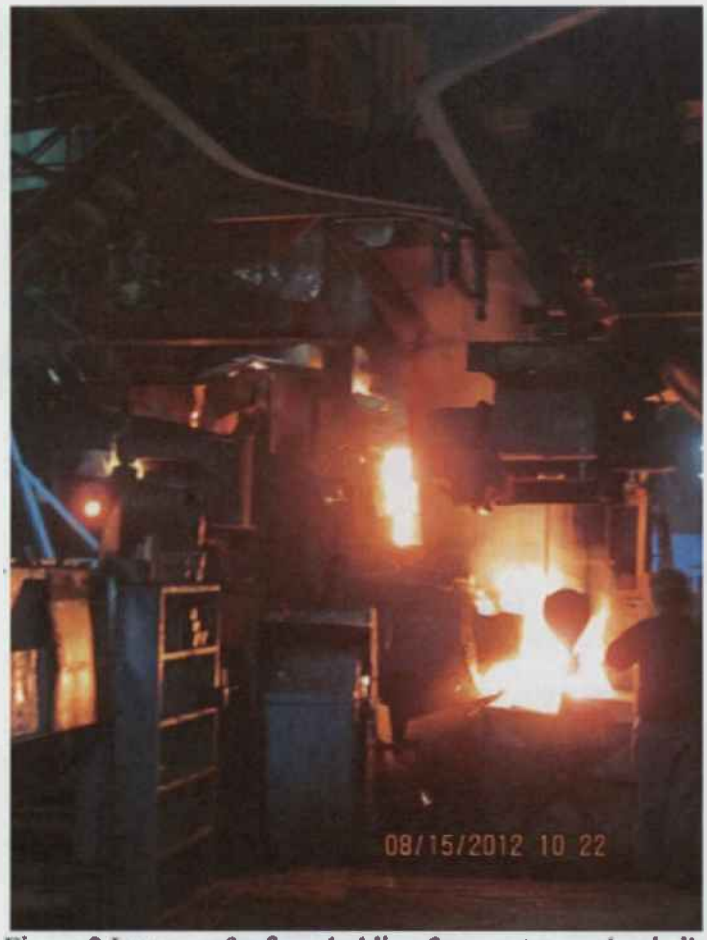

Figure 2 Iron transfer from holding furnace to pouring ladle

The molds with cores are placed along roller conveyor lines. The pouring ladle is transported to the molds on an overhead rail system and each mold is filled (Figure 3). There is overhead duct work along the roller conveyor to capture emissions during casting. After the molds have enough time to cool and solidify, the molds are transferred to the shakeout area via covered conveyors. The molds travel through a rotary shakeout (Figure 4) where they tumble and additional media are added to aid in separating the sand from the iron castings. The sand falls through screens and the metal parts are transported out of the shakeout to the sorting and finishing areas.

Figure 3 Molds ready to be cast on roller conveyor

The shakeout conveyor system is common between the five mold lines. Operators sort the iron castings on the sorting conveyor system and the parts proceed to the finishing areas. The parts are first shot blasted to remove any sand that remained after shakeout. Depending on the size of the part, they are either placed in one of three tumble blast machines or one of two hanging blasters. After being shot blasted, the parts are inspected. Grinding takes place to remove excess metal. There are three baghouses in the finishing area. The baghouses are equipped with bag leak detection systems and differential pressure is monitored.

Figure 4 Rotary shakeout (equipment in yellow)

Plant Walk through:
The plant walk through began around 9:35am. The walk through followed the process as previously discussed. EPA witnessed charging of the cupola, mold making, and casting. EPA also witnessed the transfer of iron from the cupola to the holding furnace and from the holding furnace to the pouring ladles. Mr. Buchcuski informed EPA on the tour that there is a 50% yield ratio for their operation, meaning 300 tons melted generates 150 tons of production. The walk through ended at 10:47am. 59 digital pictures and videos were taken on the walk through and copies were left with Mr. Buchcuski.

Closing Conference:
EPA informed Mr. Buchcuski that if any information shared with EPA during the inspection was deemed confidential by Grede, then he should notify EPA. Mr. Buchcuski stated that nothing shared with EPA was considered CBI. EPA agreed to follow up the inspection with an email outlining documents and questions EPA would like Mr. Flaminio to provide and answer. EPA also informed Mr. Buchcuski that if additional information was required, a Section 114 Information Request could be issued.

EPA agreed to email Mr. Flaminio requesting the following documents and answers to the following questions:

- Documents
  - Semi-Annual deviation reports for the period of 2009-present
  - Title V compliance certification reports for the period of 2009-present
- Questions
  - What was the Consent Decree for in 2006?
  - What type of testing is performed on the material from the wet dust collector and dry dust collectors? What is the material's designation?
  - How do you ensure you are meeting your emission limits for Carbon Monoxide (CO), Particular Matter (PM and PM10), Sulfur Dioxide (SO2), and Volatile Organic Hazardous Air Pollutants (VOHAP)? If you use a spreadsheet or something similar, please provide a copy of this spreadsheet from January 1, 2012-present.

The inspection ended around 11:15 am.